

Notice of Allowability

Application No.

09/839,463

Applicant(s)

WELTERLEN, TRACY J.

Examiner

Fred Ferris

Art Unit

2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 14 March 2005.
2. ☒ The allowed claim(s) is/are 1-23.
3. ☒ The drawings filed on 15 December 2000 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

JEAN R. POMERE
PRIMARY EXAMINER

DETAILED ACTION

1. *Claims 1-23 have been presented for examination based on applicant's amendment filed on 14 March 2005. Claims 1-23 have now been allowed over the prior art of record.*

Response to Arguments

2. *Applicant's amendment to the claims and arguments filed on 14 March 2005 have been fully considered and found to be persuasive.*

Regarding applicant's response to 112(1) and 112(2) rejections: *The examiner withdraws the 112(1) and 112(2) rejections in view of applicant's amendment to the claims and arguments submitted on 14 March 2005.*

Regarding applicant's response to 102(b) rejection (UFAT): *The examiner withdraws the 102(b) rejection in view of applicant's amendment to the claims and arguments submitted on 14 March 2005.*

Regarding applicant's response to 103(a) rejection (UFAT in view of Anderson): *The examiner withdraws the 102(b) rejection in view of applicant's amendment to the claims and arguments submitted on 14 March 2005.*

Allowable Subject Matter

3. *Claims 1-23 are now allowed over the prior art of record.*

The following is an examiner's statement of reasons for allowance:

Applicants are disclosing a method and system for simulating a flow field using computational fluid dynamics (CFD) by generating a grid of cells with associated variables and based on initial conditions that describe the flow field around a vehicle (an aircraft). This has been disclosed in the prior art.

While these features are individually disclosed in the prior art, the prior art of record does not meet the conditions as suggested in MPEP section 2132, namely:

*"The identical invention must be shown in as complete detail as is contained in the ... claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an **ipsissimis verbis** test, i.e., identity of terminology is not required. **In re Bond**, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990)."*

In particular, the prior art of record does not disclose the specific sequence of steps and arrangement of system elements relating to flow simulation inclusive of field flow inputs, initial conditions, grid generation (grid generator), predetermined steps calculating (by CFD solver) values based on the previous calculated step (interpolation module) by applying a flow field function to portion of calculated values, recoding calculated periodic values (recording module) for a portion of the steps, averaging values at periodic steps (averaging module), and determining the flow field for the averaged values, as now recited in the independent claims 1, 11, 17 and 23 and disclosed in applicant's specification on page 9, line 5 to page 13, line 31 and in Figure 3, in the context of the claims.

The closest prior art uncovered during examination teaches certain limitations of the claimed invention as follows:

- "UFAT – A Particle Tracer for Time-Dependent Flow Fields", D. Lane, IEEE 1070-2385/94, 1994: Teaches time-dependent (unsteady) flow fields generated using CFD simulation and generating a grid of cells with variables describing an unsteady flow field, calculating cell variables from previous values on a time increment (period) basis for a predetermined number of periods, and applying the flow field function. UFAT, however, does not teach the specific sequence of steps and arrangement of system elements relating to field flow inputs, initial conditions, grid generation, predetermined steps calculating (by CFD solver) values based on the previous calculated step by applying a flow field function to portion of calculated values, recoding calculated periodic values for a portion of the steps, averaging values at periodic steps, and determining the flow field for the averaged values, as recited in the independent claims and disclosed in applicant's specification on page 9, line 5 to page 13, line 31 and in Figure 3.

- "An Implicit Upward Algorithm for Computing Turbulent Flows of Unstructured Grids", W.K. Anderson et al, Computer Fluids, Vol. 23, No. 1, 1994: Discloses applying a time dependent (averaged) Navier-Stokes function to a simulated grid of cells and adjusting averaged values to a survey grid. However, Anderson does not teach the specific sequence of steps and arrangement of system elements relating to field flow inputs, initial conditions, grid generation, predetermined steps calculating (by CFD solver) values based on the previous calculated step by applying a flow field function to

portion of calculated values, recoding calculated periodic values for a portion of the steps, averaging values at periodic steps, and determining the flow field for the averaged values, as recited in the independent claims and disclosed in applicant's specification on page 9, line 5 to page 13, line 31 and in Figure 3.

The features noted above relating to the specific sequence of method steps and arrangement of system elements for simulating field flow as now recited in independent claims 1, 11, 17 and 23 renders the claimed invention non-obvious over the prior art of record. Claims 2-10, 12-16, and 18-22 are deemed allowable as being dependent from independent claims 1, 11, and 17 respectively. The examiner has not given patentable weight to certain limitations relating to the inventions use of computational fluid dynamics (CFD), Navier-Stokes functions, or grid generation functions, all of which are known, and disclosed in the prior art. The novel aspects of the claimed invention relate to simulating a time-accurate flow field, in a more efficient manner, by recording and balancing a predetermined number of simulation time steps (see: specification page 9, line 5 to page 10, line 21), to decrease the required computational time and more efficiently process the simulated flow field.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred Ferris whose telephone number is 571-272-3778 and whose normal working hours are 8:30am to 5:00pm Monday to Friday. Any inquiry of a general nature relating to the status of this application should be directed to the group receptionist whose telephone number is 571-272-3700. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jean Homere can be reached at 571-272-3780. The Official Fax Number is: (703) 872-9306

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